C3X LINK

DLP™ VIDEO PROJECTOR

RS-232C CONTROL SPECIFICATIONS

Document Revision 1.1 (16 December 2005)

Table of Contents

1. INTRODUCTION 3

2. CONNECTION 3

3. COMMUNICATION PROTOCOL 4

HEADER 4
PAYLOAD 4

4. COMMANDS 5

REMOTE CONTROL KEY CODES 5
OPERATION CODES 7
GET CODES 12

5. EXAMPLES 14

6. WARNINGS 14

Revision History:

Revision	Date	Software Version	Description of Change
1.1	16 December 2005	2.48.62 CL or higher	Added ON command. Command 0 is now different from command ON.
1.0	5 December 2005	2.48.60 CL or higher	Initial version.

1. Introduction

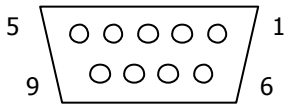
This document describes the communication and data formats used to control SIM2 C3X LINK projector via RS-232C port.

2. Connection

Switch off the Personal Computer the Projector before connecting RS 232C cable.
Use a standard serial cable with 9 pin female to the Personal Computer and 9 pin male to the Projector: pin 2 connects to pin2, pin 3 to pin 3 and pin 5 to pin 5.
SIM2 C3X LINK RS-232C Port is described as follows.

SIM 2 C3X LINK RS-232C Control Port:

D-SUB 9-pin
(female)



Pin No	Signal	Definition
1	N/A	Not used
2	TD	Transmit data
3	RD	Receive data
4	N/A	Not used
5	GND	Ground
6	N/A	Not used
7	N/A	Not used
8	N/A	Not used
9	N/A	Not used

Switch on the Personal Computer and, after start up, switch on the Projector.

Load a suitable communication software onto your Personal Computer, and set the Serial Port Parameters as shown below.

Communication Parameters:

Parameter	Value
Transfer Rate	19200 bps
Data Bits	8
Parity Bit	None
Stop Bit	1
Flow Control	None

Set Send Mode and Read Mode to HEX.

3. Communication Protocol

The communication protocol is packet oriented. Packets consists of Header and Payload.

There are two types of packets: Event and Operation.
The packet header size is fixed (7 bytes), while the packet payload type and content varies based on the type of packet: Event payload size is 6 bytes, while Operation payload size is 25 bytes.
The entire packet size is variable, being the sum of the fixed-size packet header and variable-sized packet payload: Event packet size is 13 bytes and Operation packet size is 32 bytes.

Header

All Packets use the same Packet Header format.
The Packet Header size is fixed at seven bytes.

0	1	2	3	4	5	6
BE	EF	Packet Type	Packet Payload Size		Packet Checksum (CRC)	

0xEFBE is a fixed value that is used to insure packet alignment if there are partial packets received or byte lost. The least-significant byte of the word (BE) is sent first, then the most-significant-byte (EF).

The **Packet Type** is a number (a byte in length) that defines the type of data in the packet.

The **Packet Payload Size** is a number (two bytes) that defines the size of the payload portion of the packet. For a given Packet Type, Packet Size is fixed.

The **Packet Checksum** (two bytes) is the CRC value for the entire packet (Header and Payload).

Payload

The packet payload format depends on the packet type.
The Event packet payload size is 6 bytes, while the Operation packet payload size is 25 bytes.

Event Packet Format:

0	1	2	3	4	5
Event		00	00	00	00

Operation Packet Format:

0	1	2	3	4	5	6	7	8	9	10	11	12
Op Type	Op ID		00	00	Op Target		00	00	Op Value		00	00

13	14	15	16	17	18	19	20	21	22	23	24
00	00	00	00	00	00	00	00	00	00	00	00

4. Commands

Remote Control Key Codes

The following commands send simulated Remote Control input to SIM2 C3X LINK projector.

Remote Control Keycodes:

Key	Command
STAND BY	BE EF 02 06 00 94 F7 9D 01 00 00 00 00
ON (1)	BE EF 02 06 00 A7 F7 9E 01 00 00 00 00
0 (2)	BE EF 02 06 00 6B E6 52 01 00 00 00 00
1 (3)	BE EF 02 06 00 80 E5 49 01 00 00 00 00
2 (3)	BE EF 02 06 00 B3 E5 4A 01 00 00 00 00
3 (3)	BE EF 02 06 00 62 E4 4B 01 00 00 00 00
4 (3)	BE EF 02 06 00 D5 E5 4C 01 00 00 00 00
5 (3)	BE EF 02 06 00 04 E4 4D 01 00 00 00 00
6 (3)	BE EF 02 06 00 37 E4 4E 01 00 00 00 00
7 (3)	BE EF 02 06 00 E6 E5 4F 01 00 00 00 00
8 (3)	BE EF 02 06 00 89 E7 50 01 00 00 00 00
9 (3)	BE EF 02 06 00 58 E6 51 01 00 00 00 00
10 (3)	BE EF 02 06 00 BC E0 75 01 00 00 00 00
11 (3)	BE EF 02 06 00 8F E0 76 01 00 00 00 00
12 (3)	BE EF 02 06 00 5E E1 77 01 00 00 00 00
ESC	BE EF 02 06 00 0D E6 54 01 00 00 00 00
CURSOR UP	BE EF 02 06 00 DC E7 55 01 00 00 00 00
CURSOR LEFT	BE EF 02 06 00 EF E7 56 01 00 00 00 00
CURSOR RIGHT	BE EF 02 06 00 3E E6 57 01 00 00 00 00
CURSOR DOWN	BE EF 02 06 00 C1 E6 58 01 00 00 00 00
MENU LEFT (-)	BE EF 02 06 00 10 E7 59 01 00 00 00 00
MENU RIGHT (+)	BE EF 02 06 00 23 E7 5A 01 00 00 00 00
FREEZE	BE EF 02 06 00 F2 E6 5B 01 00 00 00 00
MEMORY	BE EF 02 06 00 45 E7 5C 01 00 00 00 00
F1	BE EF 02 06 00 E6 F4 8F 01 00 00 00 00
F2	BE EF 02 06 00 89 F6 90 01 00 00 00 00
INFO	BE EF 02 06 00 A7 E6 5E 01 00 00 00 00
AUTO	BE EF 02 06 00 79 E2 60 01 00 00 00 00
ASPECT NORMAL	BE EF 02 06 00 2A F4 83 01 00 00 00 00
ASPECT ANAMORPHIC	BE EF 02 06 00 9D F5 84 01 00 00 00 00
ASPECT LETTERBOX	BE EF 02 06 00 4C F4 85 01 00 00 00 00
ASPECT PANORAMIC	BE EF 02 06 00 7F F4 86 01 00 00 00 00
ASPECT PIXEL TO PIXEL	BE EF 02 06 00 AE F5 87 01 00 00 00 00

ASPECT USER 1	BE EF 02 06 00 51 F5 88 01 00 00 00 00
ASPECT USER 2	BE EF 02 06 00 80 F4 89 01 00 00 00 00
ASPECT USER 3	BE EF 02 06 00 B3 F4 8A 01 00 00 00 00
VCR	BE EF 02 06 00 9B E3 62 01 00 00 00 00

Direct access codes

Zoom	BE EF 02 06 00 94 E6 5D 01 00 00 00 00
Focus	BE EF 02 06 00 76 E7 5F 01 00 00 00 00
Goto Brightness	BE EF 02 06 00 C7 E1 7E 01 00 00 00 00
Goto Contrast	BE EF 02 06 00 16 E0 7F 01 00 00 00 00
Goto Color	BE EF 02 06 00 19 F4 80 01 00 00 00 00
Goto Tint	BE EF 02 06 00 C8 F5 81 01 00 00 00 00

(1)

When the unit is in Standby state, this command switches on the unit and the last source memorised prior to switch off is automatically selected.

(2)

When the unit is On, this command displays the Source Selection windows of the OSD.

(3)

Selects the corresponding Source.

The response of the unit to a correct Remote Control Key Code consists of a single byte: `06`.

Operation Codes

The following codes provide direct access to SIM2 C3X LINK User Interface operations not accessible via a single Remote Control command.

Operation Codes:

Operation	Action	Command
BRIGHTNESS	INCREMENT	BE EF 03 19 00 AB 7E 03 00 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 C5 D4 04 00 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
CONTRAST	INCREMENT	BE EF 03 19 00 3E 23 03 01 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 50 89 04 01 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
COLOR	INCREMENT	BE EF 03 19 00 C1 C7 03 02 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 AF 6D 04 02 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
TINT	INCREMENT	BE EF 03 19 00 54 9A 03 03 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 3A 30 04 03 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
SHARPNESS (Video)	INCREMENT	BE EF 03 19 00 7E 0C 03 04 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 10 A6 04 04 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
SHARPNESS FILTER	INCREMENT	BE EF 03 19 00 D4 C4 03 09 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 BA 6E 04 09 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
SHARPNESS MODE	SET VIDEO	BE EF 03 19 00 7A 80 01 60 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET GRAPHICS	BE EF 03 19 00 EA 41 01 60 02 00 00 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
CINEMA MODE	SET OFF	BE EF 03 19 00 33 43 01 07 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET AUTO	BE EF 03 19 00 A3 82 01 07 08 00 00 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
VIDEO TYPE	SET NORMAL	BE EF 03 19 00 A6 1E 01 06 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET VCR	BE EF 03 19 00 36 DF 01 06 08 00 00 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
POSITION HORIZONTAL	INCREMENT	BE EF 03 19 00 55 BA 03 21 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 3B 10 04 21 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
POSITION VERTICAL	INCREMENT	BE EF 03 19 00 AA 5E 03 22 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 C4 F4 04 22 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
COLOR TEMPERATURE	SET 01	BE EF 03 19 00 D6 F4 01 C2 09 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 02	BE EF 03 19 00 46 35 01 C2 09 00 00 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 03	BE EF 03 19 00 B7 75 01 C2 09 00 00 00 00 00 00 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

COLOR TEMPERATURE	SET 04	BE EF 03 19 00 27 B4 01 C2 09 00 00 00 00 00 00 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 05	BE EF 03 19 00 15 F6 01 C2 09 00 00 00 00 00 00 04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 06	BE EF 03 19 00 85 37 01 C2 09 00 00 00 00 00 00 05 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 07	BE EF 03 19 00 74 77 01 C2 09 00 00 00 00 00 00 06 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 08	BE EF 03 19 00 E4 B6 01 C2 09 00 00 00 00 00 00 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 09	BE EF 03 19 00 10 F3 01 C2 09 00 00 00 00 00 00 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 10	BE EF 03 19 00 80 32 01 C2 09 00 00 00 00 00 00 09 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 11	BE EF 03 19 00 71 72 01 C2 09 00 00 00 00 00 00 0A 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 12	BE EF 03 19 00 E1 B3 01 C2 09 00 00 00 00 00 00 0B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 13	BE EF 03 19 00 D3 F1 01 C2 09 00 00 00 00 00 00 0C 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 14	BE EF 03 19 00 43 30 01 C2 09 00 00 00 00 00 00 0D 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 15	BE EF 03 19 00 B2 70 01 C2 09 00 00 00 00 00 00 0E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 16	BE EF 03 19 00 22 B1 01 C2 09 00 00 00 00 00 00 0F 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 17	BE EF 03 19 00 1A F9 01 C2 09 00 00 00 00 00 00 10 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 18	BE EF 03 19 00 8A 38 01 C2 09 00 00 00 00 00 00 11 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 19	BE EF 03 19 00 7B 78 01 C2 09 00 00 00 00 00 00 12 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 20	BE EF 03 19 00 EB B9 01 C2 09 00 00 00 00 00 00 13 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 21	BE EF 03 19 00 D9 FB 01 C2 09 00 00 00 00 00 00 14 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 22	BE EF 03 19 00 49 3A 01 C2 09 00 00 00 00 00 00 15 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 23	BE EF 03 19 00 B8 7A 01 C2 09 00 00 00 00 00 00 16 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 24	BE EF 03 19 00 28 BB 01 C2 09 00 00 00 00 00 00 17 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 25	BE EF 03 19 00 DC FE 01 C2 09 00 00 00 00 00 00 18 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 26	BE EF 03 19 00 4C 3F 01 C2 09 00 00 00 00 00 00 19 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 27	BE EF 03 19 00 BD 7F 01 C2 09 00 00 00 00 00 00 1A 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 28	BE EF 03 19 00 2D BE 01 C2 09 00 00 00 00 00 00 1B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 29	BE EF 03 19 00 1F FC 01 C2 09 00 00 00 00 00 00 1C 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 30	BE EF 03 19 00 8F 3D 01 C2 09 00 00 00 00 00 00 1D 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 31	BE EF 03 19 00 7E 7D 01 C2 09 00 00 00 00 00 00 1E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 32	BE EF 03 19 00 EE BC 01 C2 09 00 00 00 00 00 00 1F 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

COLOR TEMPERATURE	SET 33	BE EF 03 19 00 0E ED 01 C2 09 00 00 00 00 00 00 20 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 34	BE EF 03 19 00 9E 2C 01 C2 09 00 00 00 00 00 00 21 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 35	BE EF 03 19 00 6F 6C 01 C2 09 00 00 00 00 00 00 22 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 36	BE EF 03 19 00 FF AD 01 C2 09 00 00 00 00 00 00 23 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
GAMMA	SET ST1	BE EF 03 19 00 6F 9D 01 27 08 00 00 00 00 00 00 0B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET EN1	BE EF 03 19 00 CD 1E 01 27 08 00 00 00 00 00 00 0D 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET EN2	BE EF 03 19 00 3C 5E 01 27 08 00 00 00 00 00 00 0E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET EN3	BE EF 03 19 00 FA 59 01 27 08 00 00 00 00 00 00 06 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET EN4	BE EF 03 19 00 6A 98 01 27 08 00 00 00 00 00 00 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET EN5	BE EF 03 19 00 0E 1C 01 27 08 00 00 00 00 00 00 09 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET GR1	BE EF 03 19 00 FF 5C 01 27 08 00 00 00 00 00 00 0A 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET GR2	BE EF 03 19 00 5D DF 01 27 08 00 00 00 00 00 00 0C 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET USER	BE EF 03 19 00 0B 19 01 27 08 00 00 00 00 00 00 05 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
FREQUENCY	INCREMENT	BE EF 03 19 00 15 95 03 24 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 7B 3F 04 24 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PHASE	INCREMENT	BE EF 03 19 00 80 C8 03 25 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 EE 62 04 25 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Y/C DELAY	INCREMENT	BE EF 03 19 00 7F 2C 03 26 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 11 86 04 26 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
MAGNIFICATION	INCREMENT	BE EF 03 19 00 FF 72 03 2C 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 91 D8 04 2C 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PAN HORIZONTAL	INCREMENT	BE EF 03 19 00 6A 2F 03 2D 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 04 85 04 2D 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PAN VERTICAL	INCREMENT	BE EF 03 19 00 95 CB 03 2E 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 FB 61 04 2E 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
KEYSTONE VERTICAL	INCREMENT	BE EF 03 19 00 01 26 03 1C 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 6F 8C 04 1C 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
KEYSTONE HORIZONTAL	INCREMENT	BE EF 03 19 00 6B 9F 03 1E 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 05 35 04 1E 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

LAMP POWER	SET 200	BE EF 03 19 00 D8 EE 01 4A 08 00 00 00 00 00 00 C8 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 210	BE EF 03 19 00 B3 65 01 4A 08 00 00 00 00 00 00 D2 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 220	BE EF 03 19 00 D7 E1 01 4A 08 00 00 00 00 00 00 DC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 230	BE EF 03 19 00 64 73 01 4A 08 00 00 00 00 00 00 E6 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 240	BE EF 03 19 00 0A FD 01 4A 08 00 00 00 00 00 00 F0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET 250	BE EF 03 19 00 AD 7B 01 4A 08 00 00 00 00 00 00 FA 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
LANGUAGE	SET ENGLISH	BE EF 03 19 00 15 35 01 05 24 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET ITALIANO	BE EF 03 19 00 85 F4 01 05 24 00 00 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET FRANCAIS	BE EF 03 19 00 74 B4 01 05 24 00 00 00 00 00 00 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET DEUTSCH	BE EF 03 19 00 E4 75 01 05 24 00 00 00 00 00 00 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET ESPANOL	BE EF 03 19 00 D6 37 01 05 24 00 00 00 00 00 00 04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET PORTUGUES	BE EF 03 19 00 46 F6 01 05 24 00 00 00 00 00 00 05 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
OSD POSITION HORIZONTAL	INCREMENT	BE EF 03 19 00 82 88 03 61 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 EC 22 04 61 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
OSD POSITION VERTICAL	INCREMENT	BE EF 03 19 00 7D 6C 03 62 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 13 C6 04 62 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

INPUT 5 (COMP RGB 1) / SIGNAL TYPE	SET YCrCb AutoSync	BE EF 03 19 00 92 04 01 82 08 00 00 00 00 00 00 14 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET YCrCb 15kHz	BE EF 03 19 00 5B 0C 01 82 08 00 00 00 00 00 00 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET YCrCb 32kHz	BE EF 03 19 00 51 06 01 82 08 00 00 00 00 00 00 10 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB AutoSync	BE EF 03 19 00 97 01 01 82 08 00 00 00 00 00 00 18 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB 15kHz	BE EF 03 19 00 5E 09 01 82 08 00 00 00 00 00 00 04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB 32kHz	BE EF 03 19 00 98 0E 01 82 08 00 00 00 00 00 00 0C 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
INPUT 6 (COMP RGB 2) / SIGNAL TYPE	SET YCrCb AutoSync	BE EF 03 19 00 97 98 01 83 08 00 00 00 00 00 00 15 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET YCrCb 15kHz	BE EF 03 19 00 5E 90 01 83 08 00 00 00 00 00 00 09 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET YCrCb 32kHz	BE EF 03 19 00 54 9A 01 83 08 00 00 00 00 00 00 11 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB AutoSync	BE EF 03 19 00 92 9D 01 83 08 00 00 00 00 00 00 19 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB 15kHz	BE EF 03 19 00 5B 95 01 83 08 00 00 00 00 00 00 05 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB 32kHz	BE EF 03 19 00 9D 92 01 83 08 00 00 00 00 00 00 0D 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

INPUT 7 (COMP RGB 3) / SIGNAL TYPE	SET YCrCb AutoSync	BE EF 03 19 00 4C 4E 01 84 08 00 00 00 00 00 00 16 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET YCrCb 15kHz	BE EF 03 19 00 85 46 01 84 08 00 00 00 00 00 00 0A 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET YCrCb 32kHz	BE EF 03 19 00 8F 4C 01 84 08 00 00 00 00 00 00 12 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB AutoSync	BE EF 03 19 00 49 4B 01 84 08 00 00 00 00 00 00 1A 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB 15kHz	BE EF 03 19 00 80 43 01 84 08 00 00 00 00 00 00 06 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB 32kHz	BE EF 03 19 00 46 44 01 84 08 00 00 00 00 00 00 0E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
INPUT 8 (COMP RGB 4) / SIGNAL TYPE	SET YCrCb AutoSync	BE EF 03 19 00 49 D2 01 85 08 00 00 00 00 00 00 17 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET YCrCb 15kHz	BE EF 03 19 00 80 DA 01 85 08 00 00 00 00 00 00 0B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET YCrCb 32kHz	BE EF 03 19 00 8A D0 01 85 08 00 00 00 00 00 00 13 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB AutoSync	BE EF 03 19 00 4C D7 01 85 08 00 00 00 00 00 00 1B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB 15kHz	BE EF 03 19 00 85 DF 01 85 08 00 00 00 00 00 00 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB 32kHz	BE EF 03 19 00 43 D8 01 85 08 00 00 00 00 00 00 0F 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

MEMORY 1	RECALL	BE EF 03 19 00 85 EB 01 27 09 00 00 01 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SAVE CURRENT SETTINGS	BE EF 03 19 00 54 D6 01 27 09 00 00 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SAVE INITIAL SETTINGS	BE EF 03 19 00 45 9A 01 28 09 00 00 01 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
MEMORY 2	RECALL	BE EF 03 19 00 74 AB 01 27 09 00 00 01 00 00 00 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SAVE CURRENT SETTINGS	BE EF 03 19 00 A5 96 01 27 09 00 00 00 00 00 00 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SAVE INITIAL SETTINGS	BE EF 03 19 00 76 DE 01 28 09 00 00 02 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
MEMORY 3	RECALL	BE EF 03 19 00 E4 6A 01 27 09 00 00 01 00 00 00 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SAVE CURRENT SETTINGS	BE EF 03 19 00 35 57 01 27 09 00 00 00 00 00 00 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SAVE INITIAL SETTINGS	BE EF 03 19 00 A7 E3 01 28 09 00 00 03 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

The response of the unit to a correct Operation Code consists of the byte `1E` followed by a copy of the packet that has been sent to the unit, where, however:

- byte number 11 is set at `01`,
- CRC (bytes number 6 and 7) has been altered accordingly.

0	1	2	3	4	5	6	7
1E	BE	EF	Packet Type	Packet Payload Size		Packet Checksum (CRC)	

8	9	10	11	12	13	14	15	16	17	18	19	20
Op Type	Op ID		01	00	Op Target		00	00	Value		00	00

21	22	23	24	25	26	27	28	29	30	31	32
00	00	00	00	00	00	00	00	00	00	00	00

Get Codes

Get Commands may be used to get the current value of projector parameters.
The response to a correct Get Command consists of 33 byte packet, where Byte Number 11 contains the Validation Code (01) and bytes Number 17 and Number 18 the requested value (the least-significant byte of the value being sent first). Of course CRC (bytes number 6 and 7) has been altered accordingly.

0	1	2	3	4	5	6	7
1E	BE	EF	Packet Type	Packet Payload Size		Packet Checksum (CRC)	

8	9	10	11	12	13	14	15	16	17	18	19	20
Op Type	Op ID		01	00	Op Target		00	00	Req Value		00	00

21	22	23	24	25	26	27	28	29	30	31	32
00	00	00	00	00	00	00	00	00	00	00	00

Get Codes:

BRIGHTNESS	BE EF 03 19 00 52 2A 02 00 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	(1)
CONTRAST	BE EF 03 19 00 C7 77 02 01 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	(1)
COLOR	BE EF 03 19 00 38 93 02 02 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	(2)
TINT	BE EF 03 19 00 AD CE 02 03 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	(3)
COLOR TEMPERATURE	BE EF 03 19 00 9D 0B 02 C2 09 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	(4)
GAMMA	BE EF 03 19 00 13 25 02 27 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	(5)
MEMORY	BE EF 03 19 00 5E D5 02 27 09 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	(6)

(1) Returned value is indeterminate when the unit is in No Signal state.
Returned value may be different from the value displayed on the OSD, as in the latter, the values have been normalized to the 0-100 range.

(2) Returned value is valid only when Video, S-Video, RGBS 15 kHz, YPrPb 15 kHz or YPrPb 32 kHz signals are displayed. Returned value is indeterminate when other signals are displayed and when the unit is in No Signal state.

(3) Returned value is valid only when Video (NTSC), S-Video (NTSC), RGBS 15 kHz, YPrPb 15 kHz signals are displayed. Returned value is indeterminate when other signals are displayed and when the unit is in No Signal state.

(4) Table below associates OSD labels with returned values:

Color Temperature

OSD Label	Returned value	OSD Label	Returned value	OSD Label	Returned value	OSD Label	Returned value
01	00	10	09	19	12	28	1B
02	01	11	0A	20	13	29	1C
03	02	12	0B	21	14	30	1D
04	03	13	0C	22	15	31	1E
05	04	14	0D	23	16	32	1F
06	05	15	0E	24	17	33	20
07	06	16	0F	25	18	34	21
08	07	17	10	26	19	35	22
09	08	18	11	27	1A	36	23

(5) Table below associates OSD labels with returned values:

Gamma

OSD Label	Returned value
ST1	0B
EN1	0D
EN2	0E
EN3	06
EN4	07
EN5	09
GR1	0A
GR2	0C
User	05

(6) Table below associates OSD labels with returned values:

Memory

OSD Label	Returned value
0 (Auto)	00
1	01
2	02
3	03

5. Examples

1. **Send the simulated "SWITCH ON FROM STAND-BY" Remote Control keycode.**
   Remote Control allows Switching on from Stand-by via the key "0".
   Send the code relative to key "0":
   `BEEF020600A7F79E0100000000.`
   The projector switches on and the last source memorised prior to switch off is automatically selected.
   The projector returns the response code: `06` (Acknowledged with no error).

2. **Send the simulated "MENU RIGHT" Remote Control keycode.**
   Send the packet:
   `BEEF02060023E75A0100000000.`
   The OnScreen Display appers on the screen.
   The projector returns the response code: `06` (Acknowledged with no error).

3. **Send the "SET ASPECT ANAMORPHIC" Operation Code.**
   Send the packet:
   `BEEF0206009DF5840100000000.`
   The Aspect Ratio changes to Anamorphic.
   The projector returns the response code: `06` (Acknowledged with no error).

4. **Select "INPUT 5 (COMP RGB 1) WITH YcrCb 15kHz SIGNAL"**
   Send the packet:
   `BEEF0319005B0C0182080000000000000800000000000000000000000000000000`
   Wait for the return code and add an additional delay of 50 ms.
   Send the the code relative to the Key to which Input 5 has been assigned: for instance if the key is "3" the code is:
   `BEEF02060062E44B0100000000`

5. **Get "COLOR TEMPERATURE" Value for the Current Source**
   Send the packet:
   `BEEF0319009D0B02C2090000000000000000000000000000000000000000000000`
   The unit returns the code:
   `1EBEEF031900C41F02C2090100000000000D000000000000000000000000000000`
   where bytes Number 17 and Number 18 (underlined above) carry the requested value. The returned value is `0D` which corresponds to point 14 in the OSD Color Temperature chart.

6. Warnings

When the number of bytes sent to the Projector is greater than indicated for the Command (32 bytes for Operation Packets and 13 bytes for Event Packets), excess data will be ignored.
Conversely, if number of bytes sent to the Projector is smaller than required by the Communication Protocol, the command may be ignored.

Command execution time may vary from few milliseconds to 500 milliseconds, depending on the operation that have been requested.
If the unit is busy when a command is sent, the unit may not accept the command. If several commands are to be sent one after the other, sufficient time between them should be allowed.